

Application No. 10/692,308
Amendment Dated January 10, 2006
Reply to Office Action Dated October 10, 2005

Amendments to the Specification:

Please replace paragraph [[0007]] with the following amended paragraph [[0007]]:

The superconducting conductor elements are wound 20 helically on said carrying element in one or more layers. Each individual layer is obtained by a plurality of, for example tape-type, superconducting conductor elements being wound next to one another onto the carrying element or onto a layer that has already been wound onto the carrier element.

Please replace paragraph [[0009]] with the following amended paragraph [[0009]]:

The multifilament wires contain a multiplicity of 30 filament-type cores comprising a superconductor material which are embedded in a matrix comprising a normally conducting metal, in particular silver. In order to avoid AC losses on account of eddy currents and coupling currents, insulating layers comprising an insulating material are provided between the individual layers comprising superconducting wires.

Please replace paragraph [[0011]] with the following amended paragraph [[0011]]:

The superconductor material acquires the desired 20 high orientation as a result of the treatment described above, the crystallographic c axis essentially extending perpendicular to the current flow direction and the a-b plane extending parallel to the current flow direction. The orientation should preferably be as homogeneous as possible over the entire extent of the superconducting material.

Please replace paragraph [[0022]] with the following amended paragraph [[0022]]:

The cross-sectional form of the tape-type substrate 25 may be selected as desired, in principle. The cross section may be in, for example, rectangular, square, oval, round, polygonal, trapezoidal, etc. form. An essentially rectangular form is generally preferred, however.

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Please replace paragraph [[0024]] with the following amended paragraph [[0024]]:

One or more thin intermediate layers may be provided as buffer layer between the superconducting layer and the substrate.

Please replace paragraph [[0029]] with the following amended paragraph [[0029]]:

Particularly preferred compounds have the general formula

Please replace paragraph [[0038]] with the following amended paragraph [[0038]]:

During slow isothermal cooling, the solidification front advances from the side with the material having the highest solidification temperature to the side with the material having the lowest solidification temperature, a biaxial orientation of the crystals that form being effected.

Please replace paragraph [[0041]] with the following amended paragraph [[0041]]:

A suitable material combination comprises an arrangement of Nd₁₂₃, Y₂₁₁ and Yb₂₁₁ in this order, the following holding true for the peritectic solidification temperatures T_p : $T_p \text{ Nd}_{123} > T_p \text{ Y}_{123} > T_p \text{ Yb}_{123}$. According to this method, it is possible to obtain biaxially textured layers having a thickness of 1 μm , and in particular 5 μm or more, an excellent biaxial orientation being possible even without corresponding preorientation of the substrates. Therefore, it is not necessary to use substrates which contain a lattice matching to the biaxial texturing to be formed.

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Please replace paragraph [[0044]] with the following amended paragraph [[0044]]:

Layers of this type are particularly preferred for 5 superconducting applications.

Please replace paragraph [[0054]] with the following amended paragraph [[0054]]:

If the armoring comprises a metallically conductive 20 material, it may likewise serve to take up short-circuit currents.

Please replace paragraph [[0058]] with the following amended paragraph [[0058]]:

In addition, all of the layers or individual layers 35 may have different lay lengths or angles for the winding. It is possible to achieve a uniform current distribution over the individual layers through the selection of the winding direction and/or the angles of the winding. This is of importance for applications with alternating current since here, in the absence of corresponding measures, a nonuniform current distribution may occur over the individual layers, with a different quantity of current flowing in the individual layers.

Please replace paragraph [[0059]] with the following amended paragraph [[0059]]:

If a very high current flows in one layer, for 10 example, there is the risk of the critical limit value being exceeded.

Please replace paragraph [[0063]] with the following amended paragraph [[0063]]:

The greater degrees of freedom that become possible 30 as a result of this in the configuration of the cable mean that the cable, as required, may be configured as exactly as possible for the respective application. It is particularly advantageous that overall thinner cables can be obtained which nevertheless have sufficient superconducting properties.

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Please replace paragraph [[0077]] with the following amended paragraph [[0077]]:

Individual conductor elements of a layer, groups of 25 a plurality of conductor elements of a layer or all the conductor elements of a layer may also be electrically insulated from one another.

Please replace paragraph [[0084]] with the following amended paragraph [[0084]]:

Brushes or an airbrush were used to arrange on the 25 carrier material next to one another a 1 mm wide line comprising Nd123 (1) (5 cm long, overall about 40 mg Nd123), a 5 mm wide line comprising Y211 (2) (5 cm long, overall about 200 mg Y211) and a two millimeter wide line comprising Yb211(3) (5 cm long, overall about 90 mg) next to one another such that adjacent longitudinal edges were in contact with one another. The resulting strip was covered with a layer comprising overall 400 mg of $\text{Ba}_2\text{C}_3\text{O}_5$.

Please replace paragraph [[0085]] with the following amended paragraph [[0085]]:

The carrier material thus coated was placed in air 35 in a commercially available chamber furnace comprising an Al_2O_3 block and subjected to the following thermal treatment.

Please replace paragraph [[0088]] with the following amended paragraph [[0088]]:

On account of the different peritectic solidification temperatures T_p for different superconductors $(\text{RE})\text{Ba}_2\text{Cu}_3\text{O}_{7-x}$ where $T_p(\text{Nd123}) > T_p(\text{Y123}) > T_p(\text{Yb123})$, a gradient of the solidification temperature resulted in the overall system on account of the concentration gradient mentioned above. During the spatially isothermal, slow cooling in step 3, this promoted a directional growth of the superconductor crystals parallel to the gradient of the solidification temperature.